Documentation Roadmap for Configuring BayRS Routers and Protocols

What do you want your router to be? Whatever it is, Nortel Networks offers dozens of protocols and services so you can customize and manage your network. This roadmap provides an overview of the documentation set followed by a brief description of each manual and a link to it.

To navigate around the roadmap, click on any box. To open a specific manual, click on the name of the manual (shown in *italics*).

Locating BayRS Documentation

Hard copy, CD, and Web documents

Installing

Release notes

Installation guides

Configuring

Configuration tools

WAN protocols

Security

Line services

LAN protocols

IP protocols

ATM protocols

IBM protocols

Managing and Troubleshooting

Managing routers

Troubleshooting

Where to Locate BayRS Documentation

Your router comes with several hard-copy documents including the installation guide, release notes, known anomalies, and fixed anomalies. Other documents for configuring and managing your router come on a CD called the Online Library. This CD comes with a manual that describes how to install the online library and provides an overview of the library's features. You can view the library on a PC, UNIX, or Macintosh platform.

All manuals (except the known anomalies and fixed anomalies documents) are also available on the Web at http://www25.nortelnetworks.com/library/tpubs/

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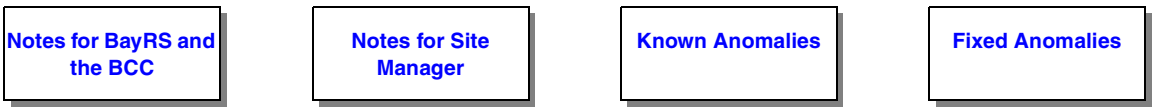
Release notes

Read the following release notes for the latest hardware and software information:



Release Notes for BayRS

These release notes provide information about the latest version of BayRS. They include information about new features, upgrading your software, general guidelines, BCC guidelines, and operating limitations. The release notes also include information about supported protocols, standards, and flash memory cards.

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Release Notes for Site Manager

These release notes provide information about the latest version of Site Manager. They include information about compatibility with BayRS, system requirements, and general guidelines.

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BayRS, BCC, and Site Manager Known Anomalies

This hard-copy document lists the known anomalies (also referred to as bugs, change requests, or CRs) that were found in the latest version of BayRS, the BCC, and Site Manager.

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BayRS, BCC, and Site Manager Fixed Anomalies

This hard-copy document lists the fixed anomalies (also referred to as bugs, change requests, or CRs) that were fixed in the latest version of BayRS, the BCC, and Site Manager.

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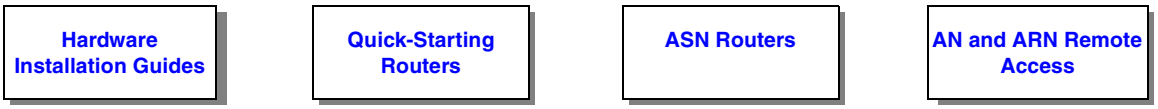
Installation

Refer to the appropriate installation guide to install your router and then read *Quick-Starting Routers* to connect it to a network.



Hardware Installation Guides

The following manuals describes how to install, configure, and maintain BayRS routers. For information about a specific platform, click on the appropriate title.

- *Installing and Maintaining BN Platforms*
- *Installing and Maintaining ASN Routers and BNX Platforms*
- *Installing and Operating AN and ANH Routers*
- *Installing and Operating ARN Routers*
- *Quick Installation and Reference for the System 5000 Net Modules*
- *Installing and Operating the Passport 5430 Multiservice Access Switch*
- *Installing and Operating the Passport 2430 Multiservice Access Switch*
- *Cable Guide* -- This guide lists the specific cables for your Nortel Networks router. If you need to meet special requirements, this guide also provides the pinout information and references to the industry specifications and standards so that you can build your own cables.

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Quick-Starting Routers

This manual describes how to boot your router locally and configure its initial interface to an IP network. When you complete the quick-start installation procedure, the router will route IP traffic on your network. This manual also describes how to install Site Manager and provides an overview of BayRS security features.

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Connecting ASN Routers to a Network

This manual describes how to boot an Access Stack Node (ASN) router over a network interface to connect it to a network.

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Configuring AN and ARN Remote Access

This manual describes how to connect Access Node (AN), Access Node Hub (ANH), and Advanced Remote Node (ARN) routers to corporate backbone networks.

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Configuration tools

Three configuration tools support BayRS: the BCC, Site Manager, and the Technician Interface. Nortel Networks recommends using either the BCC or Site Manager. In most cases, you can use either tool to configure your router.

The Technician Interface is for experienced network administrators. Nortel Networks recommends using the Technician Interface for troubleshooting only because it provides limited support for configuring protocol parameters. It also does not verify configuration files or check them for consistency before allowing you to save them.

Click on any configuration tool for a more detailed description:

Bay Command Console (BCC)

This section describes the two BCC manuals: a user guide and a quick reference.

Using the Bay Command Console (BCC)

The BCC is the Nortel Network command-line interface for configuring routers. This manual explains how to use all the BCC commands, and provides a tutorial that guides you through the initial configuration of a Nortel Networks router. You can use the BCC to perform tasks such as creating or deleting IP interfaces on the router.

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BCC Quick Reference

This quick reference provides experienced users with a sample configuration, a table of the most commonly used BCC commands, and helpful shortcuts and tips.

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Site Manager

Configuring and Managing Routers with Site Manager

Site Manager is a graphical user interface (GUI) for configuring routers. This manual describes how to create configuration files, customize software images, manage configuration files, and monitor router performance.

You can use Site Manager on a PC or a UNIX workstation and integrate it with many popular Simple Network Management Protocol (SNMP) applications, such as the Hewlett-Packard OpenView Network Node Manager.

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Technician Interface

The three manuals in this section document the Technician Interface, which resides in the router's operating system kernel. The Technician Interface automatically loads when you boot the router. You can establish a session through the router's console port, through a local ASCII terminal, or a dial-up connection.

Using Technician Interface Software

The Technician Interface is a command-line interface for configuring routers. This manual explains how to use the Technician Interface to install a router, maintain or diagnose router operation, and monitor and configure certain basic router functions.

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Using Technician Interface Scripts

Technician Interface scripts enable you to view and use information stored in the management information base (MIB). This manual describes how to use the script commands (**show/monitor** and **enable/disable**) to display statistical and configuration information about router services, and to enable or disable those services.

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Writing Technician Interface Scripts

Technician Interface scripts enable network administrators to read and execute Technician Interface commands from a remote workstation and transfer the files to the router via TFTP or XMODEM. This manual describes how to write your own Technician Interface scripts, which are very similar to UNIX shell scripts.

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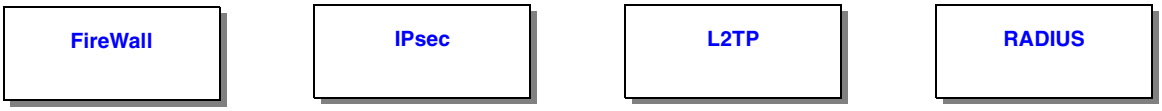
Security

Depending on your security needs, you can configure your router with one or more of the following security services and protocols.

- FireWall-1 protects data on your router from unauthorized users.
- IPsec protects data while it travels over public networks.
- L2TP protects data by creating a virtual private network (VPN).
- RADIUS protects data by authorizing remote users before giving them access to a network.

Click on any of the following security services for a more detailed description:



Configuring BaySecure FireWall-1

BaySecure FireWall-1 integrates firewall security features into the operating system of Nortel Networks BN, ASN, and ARN routers. BaySecure FireWall-1 is a firewall only, and does not include the entire suite of Check Point Software Technologies features. BaySecure FireWall-1 supports the inspection module and logging capabilities of the Check Point FireWall-1 product. This manual describes how to configure FireWall-1 services on a Nortel Networks router.

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Configuring IPsec Services

The IP Security (IPsec) standards were developed to ensure secure, private communications for the remote access, extranet, and intranet virtual private networks (VPNs) used in enterprise communications. This manual describes how to configure IPsec services on a Nortel Networks router.

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Configuring L2TP Services

Layer 2 Tunneling Protocol (L2TP) provides remote users, such as telecommuters, mobile professionals, and personnel in remote branch offices, with dial-in access to a corporate network. L2TP enables users to create a virtual private network (VPN) over a public network, such as the Internet, but offers the security and exclusivity of a private network. This manual describes how to configure L2TP services on a Nortel Networks router.

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Configuring RADIUS

Remote Authentication Dial-In User Service (RADIUS) centralizes security and controls the billing of services. *RADIUS authentication* identifies remote users before you give them access to a central network site. *RADIUS accounting* collects data during a remote user's dial-in session so that you can determine billing charges. This manual describes how to configure RADIUS services on a Nortel Networks router.

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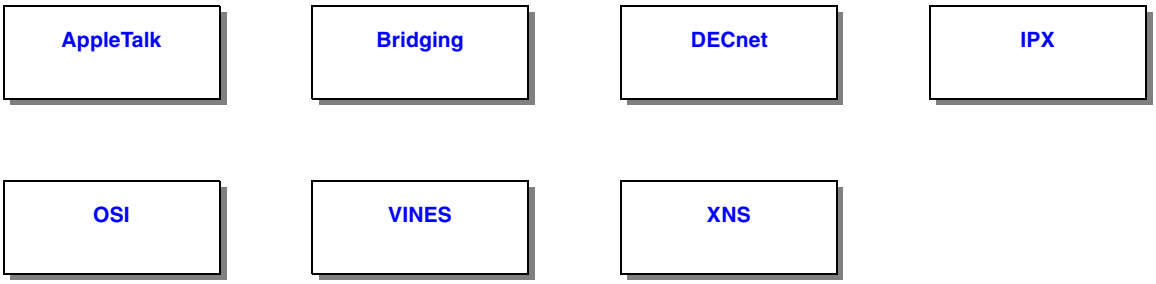
LAN protocols

Nortel Networks supports the following LAN protocols. Click on any of the following for a description:



Configuring AppleTalk Services

This manual describes how to configure AppleTalk services on a Nortel Networks router.

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Configuring Bridging Services

This manual includes information on the following topics: transparent bridges, source routing bridges, NetBIOS, translation bridges, native mode LANs, and spanning trees. This manual describes how to configure bridging services on a Nortel Networks router.

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Configuring DECnet Services

This manual describes how to configure DECnet services on a Nortel Networks router.

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Configuring IPX Services

This manual describes how to configure Internetwork Packet Exchange (IPX) services on a Nortel Networks router.

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Configuring OSI Services

This manual describes how to configure Open Systems Interconnection (OSI) services on a Nortel Networks router.

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Configuring VINES Services

This manual describes how to configure Virtual Networking System (VINES) services on a Nortel Networks router.

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Configuring XNS Services

The Nortel Networks implementation of the Xerox Networking System (XNS) protocol is based on the *Xerox System Integration Standard* specification (Xerox Corporation, December 1981), commonly referred to as *The Gray Book*. This manual describes how to configure XNS services on a Nortel Networks router.

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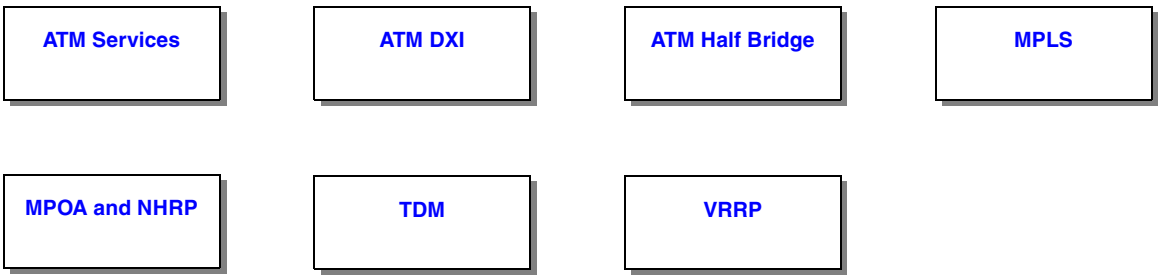
ATM protocols

Nortel Networks supports several ATM services. To configure an ATM network, start with ATM Services and then go to the other manuals for the protocols that you want to add. Click on any of the following for a description:



Configuring ATM Services

Asynchronous Transfer Mode (ATM) relays traffic across a Broadband Integrated Services Digital Network (B-ISDN). ATM provides a cost-effective way of transmitting voice, video, and data across a WAN network. ATM can also emulate a LAN network and allow virtual communication between traditional LAN devices. This manual describes how to configure ATM services on a Nortel Networks router.

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Configuring ATM DXI Services

ATM Data Exchange Interface (DXI) enables you to access an ATM network over a synchronous connection. Synchronous interfaces use link modules that work with a Fast Routing Engine (FRE) to form an Intelligent Link Interface (ILI) pair. This ILI pair must use ATM DXI as a WAN protocol to connect to an ATM data service unit/channel service unit (DSU/CSU). The DSU/CSU then converts these packets into uniform 53-byte cells for transmission over the ATM network. This manual describes how to configure ATM DXI services on a Nortel Networks router.

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Configuring ATM Half Bridge Services

The ATM Half Bridge (AHB) protocol operates on BLN and BCN routers that connect remote hosts to an IP routed network via a digital subscriber line (DSL). AHB converts bridge frames containing IP packets to unencapsulated routed frames and performs the reverse function for packets returning from the opposite direction. AHB meets the requirements of public network providers who want to develop an end-to-end solution using DSL to provide high-speed Internet and remote LAN access to ISPs and corporate networks. This manual describes how to configure AHB services on a Nortel Networks router.

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Configuring MPLS Services

Multi-Protocol Label Switching (MPLS) integrates label swapping and forwarding with network layer routing. MPLS works in an environment where traditional routing protocols (for example, OSPF and BGP) are used to maintain the routing topology and forwarding information base for each router. MPLS operates only over an ATM circuit, but it supports IP, RIP, BGP, and OSPF. This manual describes how to configure MPLS services on a Nortel Networks router.

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Configuring MPOA and NHRP Services

Multi-Protocol over ATM (MPOA) maps routed and bridged traffic flows to ATM SVCs. This technique creates network shortcuts between source and destination clients. This is generally referred to as *cut-through* or *zero-hop routing*.

Next Hop Resolution Protocol (NHRP) provides address resolution services by mapping IP addresses to ATM addresses. This manual describes how to configure MPOA and NHRP services on a Nortel Networks router.

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Configuring TDM Services

Time division multiplexing (TDM) transmits signals from multiple channels over a single path. For example, a transmitting device can interleave three incoming signals into one outgoing signal. Then the receiving device divides the single stream back into its original signals. The transmitting device allocates bandwidth to each channel on the basis of time slots, which ensures that each device gets its required share of the available bandwidth. This manual describes how to configure TDM services on a Nortel Networks router.

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Configuring VRRP Services

The Virtual Router Redundancy Protocol (VRRP) allows you to configure redundant routers to protect a network from the irrecoverable failure of one or more IP interfaces. One VRRP router acts as the master virtual router for an IP address, while other VRRP routers act as backup virtual routers. VRRP eliminates any single point of failure within your network. VRRP runs over IP, but you can also configure VRRP on an ATM network configured with Multi-Protocol over ATM (MPOA). This manual describes how to configure VRRP services on a Nortel Networks router.

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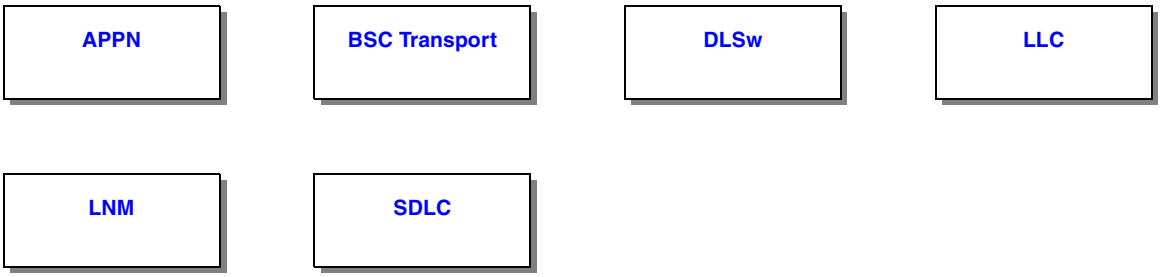
IBM protocols

Nortel Networks supports several IBM protocols and services. Click on any of the following for a description:



Configuring APPN Services

Advanced Peer-to-Peer Networking (APPN) extends IBM's Systems Network Architecture (SNA). Nortel Networks routers can serve as APPN nodes in an IBM SNA network (with or without the presence of an IBM mainframe computer). The Nortel Networks APPN implementation complies with Version 2 of the IBM APPN Network Node specification, with advanced optional APPN function sets. This manual describes how to configure APPN services on a Nortel Networks router.

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Configuring BSC Transport Services

Binary Synchronous Communication (BSC) provides transport services that enable you to transmit data over a multiprotocol network. BSC typically operates over low-speed lines up to 19.2 Kb/s. BSC is character-oriented, assumes 8-bit characters, and most often uses the EBCDIC code set for data transmission. This manual describes how to configure BSC transport services on a Nortel Networks router.

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Configuring DLSw Services

Data Link Switching (DLSw) provides the following services:

- Transports connection-oriented SNA and NetBIOS data across a network
- Prevents sessions from timing out due to slow network response time
- Reroutes traffic around failed links
- Improves response time by reducing network overhead
- Interconnects multiple locations without requiring a network manager to reconfigure existing bridges

This manual describes how to configure DLSw services on a Nortel Networks router.

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Configuring LLC Services

Logical Link Control (LLC) enables SNA devices and NetBIOS PCs to establish sessions through a LAN topology. LLC also adds higher-layer sequencing and error control in bridged LAN environments. The Nortel Networks implementation of the LLC protocol consists of LLC class 1 (LLC1), a connectionless delivery service, and LLC class 2 (LLC2), a connection-oriented service. Most protocols use LLC1, but LAN Network Manager (LNM) servers, data link switching (DLSw) services, and Advanced Peer-to-Peer Networking (APPN) require LLC2. This manual describes how to configure LLC services on a Nortel Networks router.

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Configuring LNM Services

LAN Network Manager (LNM) manages multisegment 802.5/token ring networks. Network administrators can use LNM to monitor a single LAN or a group of LANs. LNM can also communicate with the IBM NetView host-based network management product. This enables a NetView administrator to access certain operating capabilities of the LNM. This manual describes how to configure LNM services on a Nortel Networks router.

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Configuring SDLC Services

Synchronous Data Link Control (SDLC) is the synchronous, bit-oriented link control protocol in the IBM Systems Network Architecture (SNA). SDLC is not a peer-to-peer protocol like frame relay; SDLC networks consist of a primary station that controls all communication and one or more secondary stations. For example, a mainframe in Los Angeles may support a multidrop line with controllers connected to drops in offices in Boston, New York, and Washington. This manual describes how to configure SDLC services on a Nortel Networks router.

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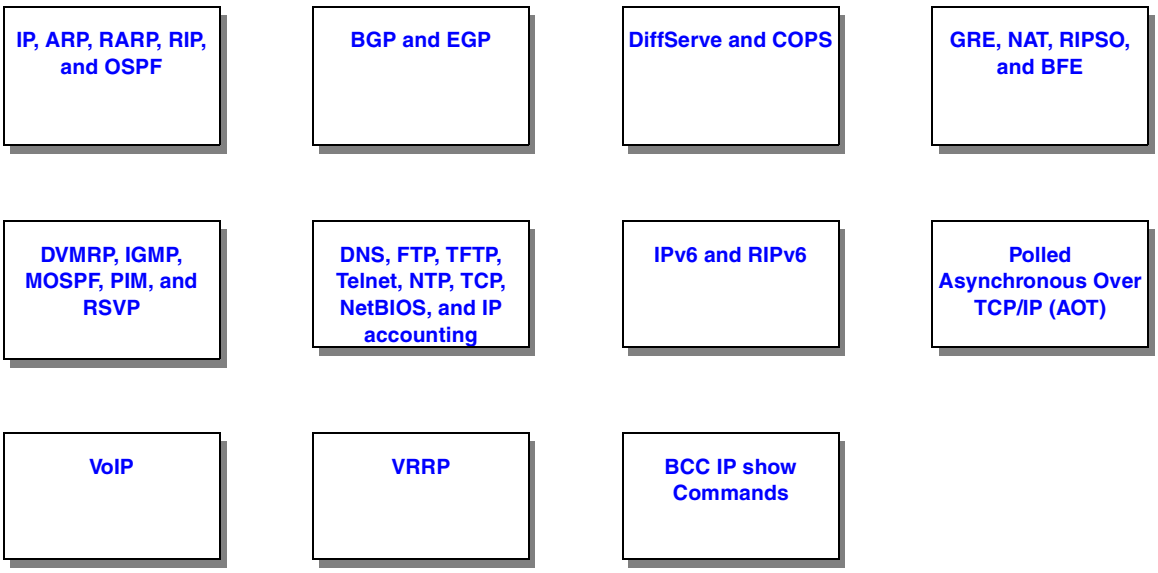
IP protocols

Nortel Networks supports several IP services. To configure an IP network, start with the IP, ARP, RARP, RIP, and OSPF manual and then go to the other manuals for the protocols that you want to add. Click on any of the following for a description:


IP, ARP, RARP, RIP, and OSPF
BGP and EGP
DiffServe and COPS
GRE, NAT, RIPSO, and BFE
DVMRP, IGMP, MOSPF, PIM, and RSVP
DNS, FTP, TFTP, Telnet, NTP, TCP, NetBIOS, and IP accounting
IPv6 and RIPv6
Polled Asynchronous Over TCP/IP (AOT)
VoIP
VRRP
BCC IP show Commands

Configuring IP, ARP, RARP, RIP, and OSPF Services

IP routers need both an IP address and a physical address to transmit data. The Internet Protocol (IP) assigns the IP address, and the Address Resolution Protocol (ARP) determines the physical address by binding an IP address to a media access control (MAC) address. You can also configure a Nortel Networks router as a Reverse Address Resolution Protocol (RARP) server. A RARP server supplies clients on the same physical or logical LAN with IP addresses.

The Routing Information Protocol (RIP) is a distance-vector protocol, which means that RIP computes distance based on the number of hops (or routers) from the source network to the target network. For RIP, the “best” path to a destination is the shortest path (the path with the fewest hops). Open Shortest Path First (OSPF) is a link-state protocol, which means that OSPF periodically tests the status of the physical connection to each of its neighboring routers, but allows you to configure the cost metrics. This manual describes how to configure IP services on a Nortel Networks router.

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Configuring IP Exterior Gateway Protocols (BGP and EGP)

Exterior gateways are routers at the edge of autonomous systems. To exchange routing information with each other and to route packets between domains, these gateways use the Border Gateway Protocol (BGP) and the Exterior Gateway Protocol (EGP). BGP routers exchange complete routing information only when they establish the peer connection. Thereafter, BGP peers exchange routing information in the form of routing updates. EGP routers periodically exchange complete routing information, not just updates. This manual describes how to configure BGP and EGP services on a Nortel Networks router.

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Configuring Differentiated Services

Differentiated services enable you to designate a specific level of performance on a packet-by-packet basis. For example, if you have applications that require high performance and reliable service, such as voice and video over IP, you can use differentiated services to give preferential treatment to this data over other traffic.

Differentiated service networks may also have a bandwidth broker, which is a server that dynamically installs filters. In these networks, the router uses the Common Open Policy Service (COPS) protocol to communicate with the bandwidth broker. COPS is a quality-of-service (QoS) policy exchange protocol for communicating network QoS policy information between the bandwidth broker and its clients. This manual describes how to configure differentiated services and COPS on a Nortel Networks router.

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Configuring GRE, NAT, RIPSO, and BFE Services

Some traffic requires special handling before it can be transported across an IP network. To meet these special needs, Nortel Networks offers the following services:

- Generic Routing Encapsulation (GRE) creates tunnels to transport non-IP traffic over IP networks.
- Network Address Translation (NAT) assigns a global IP address that maps to several unregistered local addresses. Companies that do not have enough globally unique IP addresses for each host on its network use this protocol to access the Internet. NAT can also translate unregistered addresses into registered addresses so those addresses can access the Internet.
- Revised IP Security Option (RIPSO) enables routers to use Department of Defense security labels in traffic that they transmit or receive on an IP network.
- Blacker front-end (BFE) is a classified encryption device used by hosts to communicate across unsecured wide area networks. BFE devices are typically found in government networks.

This manual describes how to configure GRE, NAT, RIPSO, and BFE services on a Nortel Networks router.

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Configuring IP Multicasting and Multimedia Services

Nortel Networks offers the following multicasting and multimedia services:

- Distance Vector Multicast Routing Protocol (DVMRP) advertises shortest-path routes to multicasting source networks, that is, any network with hosts that can issue multicast datagrams.
- Internet Group Management Protocol (IGMP) allows a host to register its local network with the local router.
- Multicast OSPF (MOSPF) forwards multicast IP traffic within an OSPF Version 2 autonomous system.
- Protocol Independent Multicast (PIM) routes multicast traffic between members of multicast groups that are distributed across various regions of the Internet.
- Resource Reservation Protocol (RSVP) allows host systems in an IP network to reserve resources on RSVP-capable routers for unicast or multicast dataflows.

This manual describes how to configure multicasting and multimedia services on a Nortel Networks router.

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Configuring IP Utilities

The following IP utilities are application protocols that use IP for message transport:

- DNS
- NetBIOS over IP
- NTP
- Telnet
- FTP
- TFTP
- TCP

This manual describes how to configure these IP utilities on a Nortel Networks router and how to configure global access policies for Telnet, FTP, TFTP, NTP, SNMP, and HTTP Server. This manual also describes how to configure IP accounting on frame relay interfaces.

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Configuring IPv6 Services

Internet Protocol version 6 (IPv6) uses 128 bits for source and destination addresses. The header also includes a flow control field that an IPv6 host can use to label packets that require special handling by IPv6 routers, such as packets that require real-time service. This manual describes how to configure IPv6 and RIPv6 services on a Nortel Networks router.

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Configuring Polled AOT Transport Services

Polled Asynchronous over TCP/IP (AOT) transports asynchronous data packets over a TCP/IP network. Polled AOT transmissions use TCP timers and keepalive settings to ensure that there is an active TCP connection between two routers before any transmission attempt. Because asynchronous transmissions are relatively slow (300 bits/s to 9600 bits/s), polling ensures that the secondary router is available for asynchronous transmission. This manual describes how to configure polled AOT transport services on a Nortel Networks router.

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Configuring Voice Services

Voice over IP (VoIP) converts telephone calls to voice packets for transport over IP networks. By combining voice and data networks, VoIP reduces cost and simplifies management. This manual describes how to configure VoIP services on a Nortel Networks ARN or Passport 5430 switch.

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Configuring VRRP Services

The Virtual Router Redundancy Protocol (VRRP) allows you to configure redundant routers to protect a network from the irrecoverable failure of one or more IP interfaces. One VRRP router acts as the master virtual router for an IP address, while other VRRP routers act as backup virtual routers. VRRP eliminates any single point of failure within your network. VRRP runs over IP, but you can also configure VRRP on an ATM network configured with Multi-Protocol over ATM (MPOA). This manual describes how to configure VRRP services on a Nortel Networks router.

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Reference for BCC IP show Commands

This manual explains how to use BCC **show** commands to display routing, configuration, interface, and statistical data about the following protocols: IP, BGP, DVMRP, GRE, IGMP, NAT, OSPF, and RIP.

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Line services

Configuring Ethernet, FDDI, and Token Ring Services

Ethernet, FDDI, and token ring services comprise the physical and data link layer (*line*) services for configured LAN circuits. This manual describes how to configure these services on a Nortel Networks router.

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Configuring WAN Line Services

WAN line services define the procedures for transferring data accurately and reliably across the physical layer (data link layer of the OSI model). Procedures include setting the clock speed, maximum transmission size, retry timer, and priority. When you configure a router, the line defaults are suitable for most networks. However, you may want to customize the line services. This manual describes how to configure WAN line services on a Nortel Networks router.

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WAN protocols

Nortel Networks supports many types of WAN protocols. For a description of a type, click on any of the following:

Dial protocols | Frame relay | PPP | SMDS | X.25

Dial protocols

Nortel Networks supports dial protocols and services. Click on the following for a description:

Dial Services | Dial VPN

Configuring Dial Services

Dial services use dial-up lines to connect remote users through a central switched network to other destinations on the network. Dial-up lines are temporary network connections that a router activates under the following conditions:

- When there is data to send across the network (dial-on-demand).
- When a failed connection needs a backup connection (dial backup).
- When a congested leased line needs an additional connection for more bandwidth (bandwidth-on-demand).

This manual describes dial-on-demand, dial backup, and bandwidth-on-demand services and how to configure these dial services on a Nortel Networks router.

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Configuring and Troubleshooting Bay Dial VPN Networks

Bay Dial VPN (virtual private network) provides secure dial-access services over telephone lines for remote users. Dial VPN offers simple and secure access to virtual private networks and the Internet through a tunnel, which is a secure, virtual, direct path between two end points. This manual describes how to configure Dial VPN services on a Nortel Networks router.

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Frame relay

Configuring Frame Relay Services

Frame relay is a high-speed, packet-switching WAN protocol that connects geographically dispersed LANs. Frame relay is a connection-oriented protocol, which means that it relies on end-to-end paths between devices connected across the network. It implements these connections using permanent virtual circuits (PVCs) or switched virtual circuits (SVCs). This manual describes how to configure frame relay services on a Nortel Networks router.

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PPP

Configuring PPP Services

Point-to-Point Protocol (PPP) creates an interface between peer routers to allow them to exchange data. PPP also allows peers to negotiate and determine data link and network layer options. When negotiations complete successfully, PPP encapsulates the data and transmits it over the link. This manual describes how to configure PPP services on a Nortel Networks router.

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SMDS

Configuring SMDS

Switched Multimegabit Data Service (SMDS) is a public, high-speed, packet-switched network service that enables you to connect local area networks across wide area networks. SMDS provides connectionless data transfer across a wide area network without establishing a logical end-to-end connection. To send information across the network, SMDS divides data into fixed 53-byte cells. The use of cell technology makes SMDS well suited for traffic that consumes high bandwidth for short periods of time. This manual describes how to configure SMDS services on a Nortel Networks router.

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X.25 protocols

Nortel Networks supports X.25 protocols and services. Click on the following for a description:

Configuring X.25 Services

X.25 transports LAN traffic to packet-switching networks, usually over public data networks. Because public data networks typically use error-prone analog lines, the X.25 protocol provides extensive error checking, recovery, and packet sequencing. X.25 also allows many different kinds of equipment to communicate across networks at a relatively low cost. This manual describes how to configure X.25 services on a Nortel Networks router.

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Configuring X.25 Gateway Services

X.25 Gateway enables you to send and receive messages between X.25 and TCP/IP networks. It maps TCP sockets to X.25 virtual circuits (and vice versa) or to Link Access Procedure Balanced (LAPB) point-to-point connection identifiers. The LAPB information field contains the X.25 data packet. When an X.25 packet reaches the destination router, the LAPB protocol strips away the LAPB frame and delivers the packet to the network layer for further processing. This manual describes how to configure X.25 gateway services on a Nortel Networks router.

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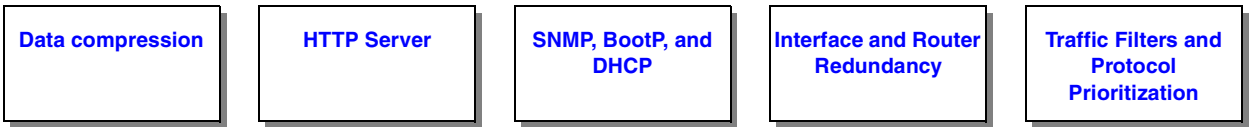
Managing Routers

Nortel Networks offers several router management tools. Click on any of the following for a description:



Configuring Data Compression Services

Data compression eliminates redundancy in data streams and reduces the amount of bandwidth needed to transport LAN protocols over a wide area network. Nortel Networks supports data compression over frame relay, X.25, and PPP (dial-up or leased lines). This manual describes how to configure data compression services on a Nortel Networks router.

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Managing Routers Using the HTTP Server

HTTP Server is a Web-based router management tool with a graphical user interface. The HTTP Server is part of the BayRS software and is accessible from any standard Web browser. Using the HTTP Server software, you can monitor and manage your network's performance on a device-by-device basis. For example, you can see where congestion is occurring or where transmission or reception problems exist. This manual describes how to configure the HTTP Server on a Nortel Networks router.

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Configuring SNMP, BootP, and DHCP Services

The Simple Network Management Protocol (SNMP) communicates management information between SNMP *managers* and SNMP *agents*. These messages enable you to access and manage objects in a router's management information base (MIB).

The Bootstrap Protocol (BootP) allows a diskless client to broadcast a request to boot from a remote server on the same network or on a different physical network. When a suitable server receives the BOOTREQUEST packet, it transmits the boot file to the client via a transfer protocol, such as Trivial File Transfer Protocol (TFTP).

Dynamic Host Configuration Protocol (DHCP) is an extension of BootP. DHCP allows designated DHCP servers to automatically assign IP addresses and host names to dynamically configured DHCP clients for a predefined period of time.

This manual describes how to configure SNMP, BootP, and DHCP services on a Nortel Networks router.

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Configuring Interface and Router Redundancy

Redundancy services enable a router to recover from either interface or router failure with minimal delay.

- Interface redundancy protects your network from failures of individual LAN interfaces by backing up one interface with another interface on the same router.
- Router redundancy protects a network from the irrecoverable failure of an entire router. You configure routers to be members of a router redundancy group, which includes a primary router and one or more secondary routers that take over if the primary router fails.

This manual describes how to configure interface and router redundancy services on a Nortel Networks router.

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Configuring Traffic Filters and Protocol Prioritization

Traffic filters manage customer traffic and reduce network congestion. Inbound traffic filters can restrict access to nodes in a network. Outbound traffic filters ensure timely delivery of critical data, or restrict traffic leaving the network.

Protocol prioritization enables the router to sort traffic into priority queues (High, Normal, and Low). Protocol prioritization is an outbound traffic filter mechanism that affects the sequence in which data leaves an interface; it does not affect traffic as it arrives at the router.

This manual describes how to configure traffic filters and prioritize traffic on a Nortel Networks router.

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Troubleshooting

Nortel Networks provides several troubleshooting tools to isolate and solve problems. Click on any of the following for a description:

Troubleshooting Routers | RMON and RMON2 | Event Messages | BCC IP show Commands

Troubleshooting Routers

Nortel Networks routers come with troubleshooting tools that help you diagnose and remedy router problems. This manual explains how to use those tools to:

- Display event messages.
- Display and change configuration settings and statistics.
- Use the `ping` command.
- Use the packet capture tool.
- Use inbound Telnet to access the Technician Interface.

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Configuring RMON and RMON2

RMON and RMON2 (*Remote MONitoring*) provide remote troubleshooting and monitoring within a LAN segment and across an enterprise network.

- RMON provides statistics at the media access control (MAC) layer, allowing you to capture real-time information across the entire network.
- RMON2 extends the scope of RMON beyond the MAC layer to provide statistics on network and application layer traffic (layers 3 through 7 of the OSI model). By monitoring higher-layer protocols, you can get an internetwork or enterprise-wide view of network traffic.

This manual describes how to configure RMON and RMON2 services on a Nortel Networks router.

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Event Messages Database

The event messages database contains a description of all the messages that appear in BayRS router event logs, except for Debug events. If you monitor the log file and see a message that you do not understand, use the event code to query the event database for a description and a course of action. Third-party network management software can also use the event code to retrieve information from the database.

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Reference for BCC IP show Commands

This manual explains how to use BCC **show** commands to display routing, configuration, interface, and statistical data about the following protocols: IP, BGP, DVMRP, GRE, IGMP, NAT, OSPF, and RIP.

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